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EXAMINER	
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ART UNIT	**PAPER NUMBER**
2683	

DATE MAILED: 01/24/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/738,086	LI ET AL.	
	Examiner	Art Unit	
	Meless N Zewdu	2683	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *19 August 2004*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-62* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *5,6,9-11,21,22,24,25,29,34,35,38-42,50,51,53 and 54* is/are allowed.

6)☒ Claim(s) *1-4, 7, 8, 12-20, 23, 26-27, 30-33, 36, 37, 43-49, 52, 55, 56, 58-62* is/are rejected.

7)☐ Claim(s) *28 and 57* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. This action is in response to the communication filed on 8/19/04.

2. Claims 1-62 are pending in this action.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 12, 17, 18, 30, 46, 47 are rejected under 35 U.S.C. 102(b) as being anticipated by Ritter (DE 19800953 C1).

As per claim 1: a method for sub-carrier selection for a system employing orthogonal frequency division multiple access (OPDMA) comprising:

a subscriber measuring channel and interference information for a plurality of sub-carriers based on pilot symbols received from a base station reads on 953 (see abstract).

the subscriber selecting a set of candidate sub-carriers reads on '953 (see abstract). Each mobile station, determining the quality of a preferred segment, suitable for its own connection, s same as selecting a set of desirable sub-carriers.

the subscriber providing feedback information on the set of candidate sub-carriers to the base station reads on '953 (see abstract).

the subscriber receiving an indication of sub-carriers of the set of sub-carriers selected by the base station for use by the subscriber reads on '953 (see abstract). Since a segment includes a plurality of sub-carriers, it can be considered as a set of subcarriers.

As per claim 30: an apparatus comprising:

a plurality of subscribers in a first cell to generate feedback information indicating clusters of sub-carriers desired for use by the plurality of subscribers reads on '953 (see abstract).

a first base station in the first cell, the first base station to allocate OFDMA sub-carriers in clusters to the plurality of subscribers reads on '953 (see abstract). Segments of the frequency spectrum in the prior art are sub-carriers/clusters.

each of a plurality of subscribers to measure channel and interference information for the plurality of subcarriers based on pilot symbols received from the first base station reads on '953 (see abstract).

at least one of the plurality of subscribers to select a set of candidate sub-carriers from the plurality of sub-carriers, and the one subscriber to provide feedback information on the set of candidate sub-carriers to the base station and to receive an indication of sub-carriers from the set of sub-carriers selected by the first base station for use by the one subscriber reads on '953 (see abstract). The reference's one base station reads on the claimed feature since there is no mentioning of a second base

station. Furthermore, the base station evaluates the information it receives from a particular mobile station and assigns segment/sub-carriers as requested. Since the allocation is based on information and evaluation, it has to be selected so as to meet the desired criteria.

As per claim 12: the method, wherein the pilot symbols occupy an entire OFDM frequency bandwidth reads on '953 (see abstract). In the prior, the pilot symbols occupy the entire OFDM frequency bandwidth.

As per claim 17: the method wherein the indication of sub-carriers is received via a downlink control channel reads on '953 (see abstract).

As per claim 18: the method wherein the plurality of subcarriers comprises all sub-carriers allocable by a base station reads on '953 (see abstract). In the prior, the pilot symbols occupy the entire OFDM frequency bandwidth.

As per claim 46: the apparatus wherein the indication of sub-carriers is received via a downlink control channel between the base station and the at least one subscriber reads on '953 (see abstract).

As per claim 47: the apparatus wherein the plurality of sub-carriers comprises all subcarriers allocable by a base station reads on '953 (see abstract). In the prior, the pilot symbols occupy the entire OFDM frequency bandwidth.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 2-4, 8, 13, 31-33 and 37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ritter as applied to claim 1 above, and further in view of Wong (US 6,330,460 B1).

As per claim 2: the method, further comprising:

the subscriber continuously monitoring reception of the pilot symbols known to the base station reads on '953 (see abstract). The subscriber/s must continuously monitore for the pilot symbols transmitted by a base station in order to acquire a communication channel. But, Ritter does not explicitly teach about a subscriber measuring signal-plus-interference-to-noise ratio (SINR) of each cluster of sub-carriers, as claimed by applicant. However, in a related field of endeavor, Wong teaches that a subscriber station/mobile station is capable of measuring signal-plus-interference-to-noise ratio (SINR) (see col. 8, lines 11-26). Therefore, it would have been obvious for one of ordinary skill in the art at the time the invention was made to modify Ritter's reference with the teaching of Wong for the advantage enabling

Ritter's base station determine the highest acceptable traffic data rate for a particular mobile station.

As per claim 3: the method, further comprising the subscriber measuring inter-cell interference, wherein the subscriber selects candidate subcarriers based on the inter-cell interference reads on '460 (see col. 8, lines 11-26). In Ritter, the mobile station selects suitable segment/sub-carrier. When the references are combined as shown in the rejection of claim 2, the selection will be based on the inter-cell interference as measured by the mobile station/subscriber, according to the teaching of Wong.

As per claim 4: the method further comprising the base station selecting sub-carriers for the subscriber based on inter-cell interference avoidance reads on '460 (see col. 8, lines 11-26).

As per claim 8: the method further comprising the subscriber using information from pilot symbol periods and data periods to measure channel and interference information reads on '460 (see col. 8, lines 11-26). In Ritter, the subscriber receives pilot symbols which it can use to measure channel and interference, as taught by Wong.

As per claim 13: the method wherein at least one other pilot symbol from a different cell transmitted at the same time as the pilot symbols received from the base station collide with each other reads on '460 (see col. 8, lines 11-26). The combined prior art teaches measuring interference based on information extracted (in Ritter) from pilot symbols transmitted by a base station. Interference, in the context of the prior art, is measured so as to avoid, by being aware of it, communication loss if it occurs to the extent of undesired degree. It is obvious that if two pilot symbols from neighboring cells

sites are allowed to collide, they will. But, what will be the benefit? Hence, colliding two signals, as claimed, does not carry patentable weight.

As per claim 31: the apparatus wherein each of the plurality of subscribers continuously monitors reception of the pilot symbols known to the base station reads on '953 (see abstract). The subscriber/s must continuously monitor for the pilot symbols transmitted by a base station in order to acquire a communication channel. But, Ritter does not explicitly teach about a subscriber measuring signal-plus-interference-to-noise ratio (SINR) of each cluster of sub-carriers, as claimed by applicant. However, in a related field of endeavor, Wong teaches that a subscriber station/mobile station is capable of measuring signal-plus-interference-to-noise ratio (SINR) (see col. 8, lines 11-26). Since the features of claim 31 are similar to the features of claim 2, claim 31 is rejected on the same ground and motivation as claim 2.

As per claim 32: the apparatus wherein each of the plurality of subscribers measures inter-cell interference, wherein the at least one subscriber selects candidate sub-carriers based on the inter-cell interference reads on '460 (see col. 8, lines 11-26). In Ritter, the mobile station selects suitable segment/sub-carrier. When the references are combined as shown in the rejection of claims 2 and 31, the selection will be based on the inter-cell interference as measured by the mobile station/subscriber, according to the teaching of Wong.

As per claim 33: the apparatus defined in Claim 32 wherein the base station selects sub-carriers for the one subscriber based on inter-cell interference 3 avoidance reads on '460 (see col. 8, lines 11-26).

As per claim 37: the apparatus defined in Claim 30 wherein the at least one subscriber uses information from pilot symbol periods and data periods to measure channel and interference information reads on '460 (see col. 8, lines 11-26). In Ritter, the subscriber receives pilot symbols which it can use to measure channel and interference, as taught by Wong.

Claims 15, 16, 44 and 45 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ritter in view of Frodigh as applied to claim1 and 14 above, and further in view of Westroos et al. (Westroos) (US 6,327,472).

As per claim 15: but, the above mentioned references do not explicitly teach about a base station having additional information that comprises traffic load information on each cluster of sub-carriers, as claimed by applicant. However, in a related field of endeavor, Westroos teaches about the use of a load monitoring device that collects and holds traffic information on neighboring cells (see col. 2, line 44-col. 3, line 10; col.5, lines 19-65). Therefore, it would have been obvious for one of ordinary skill in the art at the time the invention was made to further modify the above references with the teaching of Westroos for the advantage of making load dependent channel allocation. Note: although Westroos' traffic load information collector/holder is residing in the MSC, it is by choice of design. It could have been placed in, for example, the BSC or BS, as well.

As per claim 16: the method wherein the traffic load information is provided by a data buffer in the base station reads on .472 (see col. 5, lines 45-65). Also, see the explanation above.

As per claim 44: but, the above mentioned references do not explicitly teach about a base station having additional information that comprises traffic load information on each cluster of sub-carriers, as claimed by applicant. However, in a related field of endeavor, Westroos teaches about the use of load monitoring device that collects and holds traffic information on neighboring cells (see col. 2, line 44-col. 3, line 10; col.5, lines 19-65). Motivation is same as provided in the rejection of claim 15 above.

As per claim 45: the apparatus wherein the traffic load information is provided by a data buffer in the base station reads on .472 (see col. 5, lines 45-65). Also, see the explanation above.

Claims 19, 20, 23, 48, 49 and 52 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ritter as applied to claim 1 above, and further in view of Bodin et al. (Bodin) (US 5,507,034).

As per claim 19: Ritter discloses about a subscriber sending feedback information to a base station in an OFDMA communication system using segmented spectrum channels, which is same as sub-carriers (see abstract). But, Ritter does not explicitly teach about arbitrarily ordering the set of candidates of sub-carriers as cluster of sub-carriers, as claimed by applicant. However, in a related field of endeavor, Bodin teaches that frequencies can be sequentially ordered and assigned priorities (see col. 3, lines 44-64). Therefore, it would have been obvious for one of ordinary skill in the art at the time the invention was made to modify Ritter's reference with the teaching of Bodin for the advantage of selecting a bandwidth/channel for a pending communication.

As per claim 20: the method wherein arbitrarily order candidate clusters comprise clusters in an order with most desirable candidate clusters being listed first reads on '034 (see col. 3, lines 44-64).

As per claim 23: the method wherein providing feedback information comprises sequentially ordering candidate clusters reads on '034 (see col. 3, lines 44-64).

As per claim 48: Ritter discloses about a subscriber/subscribers sending feedback information to a base station in an OFDMA communication system using segmented spectrum channels, which is same as sub-carriers (see abstract). But, Ritter does not explicitly teach about arbitrarily ordering the set of candidates of sub-carriers as cluster of sub-carriers, as claimed by applicant. However, in a related field of endeavor, Bodin teaches that frequencies can be sequentially ordered and assigned priorities (see col. 3, lines 44-64). Motivation is same as provided in the rejection of claim 19 above.

As per claim 49: the apparatus wherein arbitrarily order candidate clusters comprise clusters in an order with most desirable candidate clusters being listed first reads on '034 (see col. 3, lines 44-64).

A**s per claim 52**: the apparatus wherein providing feedback information comprises sequentially ordering candidate clusters reads on '034 (see col. 3, lines 44-64).

Claim 62 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ritter In view of Feuerstein et al. (Feuerstein) (US 6,242,565).

As per claim 62: an apparatus comprising:

a plurality of subscribers in a cell reads on '953 (see abstract, particularly, lines 3-6).

a base station in the cell, the base station to perform sub-carrier allocation for OFDMA to allocate OFDMA sub-carriers in clusters to the plurality of subscribers reads on '953 (see abstract, particularly, lines 3-6). But, Ritter does not explicitly teach if the allocation of sub-carriers to the plurality of subscribers is based on inter-cell interference avoidance and intra-cell traffic load balancing as claimed by applicant. However, in a related field of endeavor, Feuerstein teaches that cluster of cell sites may be utilized in measuring local interference and/or local traffic load conditions (see col. 2, lines 27-37). Therefore, it would have been obvious for one of ordinary skill in the art at the time the invention was made to modify Ritter's reference with the teaching of Feuerstein's for the advantage of providing load balance of the traffic. Note: the base station in Ritter's reference allocates segments of the frequency spectrum to mobile stations **in response to the feedback information,** it receives from the mobile station. When the references are combined as shown above, the allocation in response to the feedback information will be based on the locally measured interference and load conditions of the system as taught by Feuerstein.

Claims 7, 14, 26, 36, 55, 58, 60 and 61 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ritter in view of Frodigh et al. (Frodigh) (US 5,726,978). For examination purpose, claim 58 is considered first.

As per claim 58: a method comprising:

the base station allocating sub-carriers to establish a data link between the base station and the subscriber reads on '953 (see abstract). But, Ritter does not explicitly teach about a base station allocating a first portion of the sub-carriers and allocating a

second portion of the sub-carriers to the subscriber to increase communication bandwidth, as claimed by applicant. However, in a related field of endeavor, Frodigh advantageously teaches about a method of adaptively allocating selected sub-carriers to subscribers (see col. 4, lines 32-49). Therefore, it would have been obvious for one of ordinary skill in the art at the time the invention was made to modify Ritter's reference with the teaching of Frodigh for the advantage of lessening co-channel interference between cells of the system (see col. 4, lines 25-31). Note: adaptive allocation of sub-carriers can increase or decrease a communication bandwidth.

As per claim 60: a base station comprising:

means for allocating sub-carriers to establish a data link between the base station and the subscriber reads on '953 (see abstract). But, Ritter does not explicitly teach about a means for allocating a first portion and a second portion of the sub-carriers to a subscriber to increase communication bandwidth, as claimed by applicant. However, in a related field of endeavor, Frodigh teaches that in an OFDMA system subcarriers can be selected and adaptively allocated based on set allocation criteria (see col. 4, lines 32-49). Therefore, it would have been obvious for one of ordinary skill in the art at the time the invention was made to modify the teaching of Ritter with that of Frodigh for the advantage of lessening co-channel interference between cells of the system (see col. 4, lines 25-31). Note: adaptive allocation of sub-carriers can increase or decrease a communication bandwidth.

As per claim 61: the apparatus defined in Claim 60 wherein the base station allocates the second portion after allocating each subscriber in the cell

sub-carriers to establish a data link between the base station and said each subscriber reads on '979 (see col. 4, lines 32-49). When the references are combined as shown above, bandwidth will be allocated adaptively.

As per claim 7: the method further comprising the subscriber submitting new feedback information after being allocated the set of subscribers to be allocated a new set of sub-carriers and thereafter the subscriber receiving another indication of the new set of sub-carriers reads on '979 (see col. 4, lines 32-49). When the references are combined as shown above, bandwidth will be allocated adaptively—which can include allocating a first and a second portion as needed.

As per claim 14: the method further comprising the base station selecting the sub-carriers from the set of candidate sub-carriers based on additional information available to the base station reads on '979 (see col. 4, lines 32-49). It is obvious that adaptive allocation requires repeated request for more or less bandwidth.

As per claim 26: the method defined in Claim 1 further comprising:

the base station allocating sub-carriers to establish a data link between the base station and the subscriber reads on '953 (see abstract). But, Ritter does not explicitly teach about the base station allocating a second portion, after a first portion is allocated, of the sub-carriers to the subscriber to increase communication bandwidth. However, in a related field of endeavor, Frodigh teaches that in an OFDMA system sub-carriers can be selected and adaptively allocated based on set allocation criteria (see col. 4, lines 32-49). The motivation is as provided in the rejection of claim 58.

As per claim 27: the method wherein the base station allocates the second portion after allocating each subscriber in the cell sub-carriers to establish a data link between the base station and said each subscriber reads on '978 (see col. 4, lines 32-49). Adaptive allocation includes/considers the needs of subscribers operating under the adaptively allocating base station.

As per claim 36: the apparatus wherein the subscriber submits new feedback information after being allocated the set of subscribers to receive a new set of sub-carriers and thereafter receives another indication of the new set of sub-carriers reads on '979 (see col. 4, lines 32-49). When the references are combined as shown above, bandwidth will be allocated adaptively—which can include allocating a first and a second portion as needed.

As per claim 43: the apparatus wherein the base station selects the sub-carriers from the set of candidate sub-carriers based on additional information available to the base station reads on '979 (see col. 4, lines 32-49). It is obvious that adaptive allocation requires repeated request for more or less bandwidth.

As per claim 55: the apparatus wherein the base station allocates the sub-carriers to establish a data link between the base station and the subscriber reads on '953 (see abstract). But, Ritter does not explicitly teach about a base station allocating a second portion, after a first portion has been allocated, of the sub-carriers to the subscriber to increase communication bandwidth However, in a related field of endeavor, Frodigh teaches that in an OFDMA system sub-carriers can be selected and adaptively

allocated based on set allocation criteria (see col. 4, lines 32-49). The motivation is as provided in the rejection of claim 58.

As per claim 56: the apparatus wherein the base station allocates the second portion after allocating each subscriber in the cell sub-carriers to establish a data link between the base station and said each subscriber reads on '978 (see col. 4, lines 32-49). Adaptive allocation can allow the base station to perform this feature priority.

As per claim 59: the method wherein the base station allocates the second portion after allocating each subscriber in the cell sub-carriers to establish a data link between the base station and said each subscriber reads on '978 (see col. 4, lines 32-49). Adaptive allocation can allow the base station to perform this feature priority.

Allowable Subject Matter

Claims 5-6, 9-11, 21-22, 24-25, 29, 34-35, 38-42, 50-51 and 53-54 are allowed.

The following is an examiner's statement of reasons for allowance:

As per claims 5-6, 9-11, 21-22, 24-25, 29, 34-35, 38-42, 50-51 and 53-54: the claims are directed to orthogonal frequency division multiple access (OFDMA). The prior art of record does not teach or fairly suggest the techniques of sub-carrier selection and allocation, employing OFDMA, as defined by the above claims, particularly claims 5, 9, 11, 21, 24, 29, 34, 38, 50 and 53, and further argued by applicant.

Claims 28 and 57 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Response to Arguments

Applicant's arguments filed 8/19/04 have been fully considered but they are not persuasive. Applicant's arguments and corresponding examiner's responses follow as shown below.

Note: applicant indicates that claim has been amended in the current amendment (see Remarks page 18). But, claim 1 in the list of claims is indicated as (Original). Furthermore, there is not change made in the scope of claim 1. In other words, claim 1 is an original claim, at least with respect to the current amendment. Hence, examiner considers the indication to claim, as an amended claim, as an error.

Argument I: with regard to claims 1, 12, 17, 18-20, 23, 30, 46, 47-49 and 52, mainly regarding claim 1, applicant argues by saying Ritter does not teach the claimed feature that subscriber measures both channel information and interference information for multiple sub-carriers based on pilot symbols received from a base station.

Response I: examiner respectfully disagrees with the argument. First, it should be pointed out that the notion a "subscriber measures channel information and interference information" is technically incorrect. It is a subscriber's unit or device or apparatus that provides a measured quantity regarding a channel quality or/and a quantified interference level between channels. Furthermore, examiner does not see how "channel information and interference information" can be measured, since information is something that is collected and exchanged, as oppose to measured. For example, can we say "lets measure that information? Going back to the response, since "channel information and interference information" can mean any information, examiner considers Ritter's sub-carrier quality measurement, through each mobile station, as providing channel and interference information to its base station. This is supported by the fact that the reference shows, an OFDMA multi carrier channel allocation; transmission of data symbols by a base station; measuring the quality of different segments (segment of carriers) of frequency spectrum. Hence, channel quality information, in such OFDMA, environment must include at least channel strength and interference level. Without this, the quality of a given channel, in the given environment, cannot be determined.

Argument II: with regard to claims 2-4, 8, 13, 31-33 and 37: applicant argues by saying "Ritter does not teach measuring interference, nor measuring SINR of each of the clusters of sub-carriers. Wong's disclosure focuses on the beam-forming associated with an antenna array for use in a wireless communication system. The wireless communication system described in Wong is a CDMA communication system. There is

no mention of an OFDMA system. Applicant respectfully submits that because of the difference between CDMA and OFDMA, one skilled in the art would not look to combine the CDMA-based teaching of Wong with the OFDMA teaching of Ritter to arrive at the present invention as claimed."

Response II: examiner respectfully disagrees with the argument. In that arranging a spectrum of frequencies in sub-carriers is different from the technique of selecting and/or allocating those sub-carriers to the intended subscribers. Thus, one skilled in the art having sub-carriers employing OFDMA, as shown in Ritter, would look other types of multiple accesses, like CDMA, for the purpose of efficiently maximizing channel allocation and/or selection. In other words, both of the references are related by a factor of multiple access, and, thus, are closely related arts and combinable. The next issue is about measuring SINR. Examiner agrees and showed in the rejection of the above claims that Ritter does not explicitly teach about measuring SINR. For that reason Wong's reference was used which teaches/provides a mobile station that measures SINR. So, when Wong's mobile station with the capability of measuring SINR is adapted to Ritter's OFDMA subcarriers, it would be able to measure the SINR of those subcarriers. Hence, the argument is not persuasive.

Argument III: with regard to claims 3, 4, 32 and 33, applicant argues by saying Wong does not teach or mention nor disclose that inter-cell interference is measured along with an SINR value as in the present invention, as claimed,

Response III: examiner respectfully disagrees with the argument. Wong's reference teaches about plurality of cells (see col. 7, lines 19-27) and mobile stations (see col. 7,

lines 48-67) to which the SINR measurement (see col. 8, lines 1-26) is related to. Besides, the "beam" in Wong is a radio communication signal occupying part of the communication spectrum. Furthermore, it is self evident that SINR includes a measure of interference, outside of itself and could be from any source, which could include inter-cell signal or a signal from another nearby mobile station. Hence, this line of argument is not persuasive.

Argument IV: with regard to claims 4 and 33, applicant argues by saying neither Wong nor Ritter teaches, mentions nor disclose interference avoidance in the context of OFDMA.

Response IV: examiner respectfully disagrees with the argument. In that Wong teaches interference avoidance based on S"I"NR measurement by the mobile station. So, when the references are combined as shown above, Wong's interference avoidance technique would be in the context of Ritter's OFDMA. Hence, examiner did not find the argument persuasive.

Argument V: with regard to claim 13, applicant asserts that Ritter nor Wong, discloses the feature "at least one pilot symbol from another cell is transmitted at the same time as pilot symbols received from a base station and collision occurs."

Response V: examiner believes that if pilot symbols, from different cells, are transmitted at the same time and allowed to collide, they obviously would. This fact is averted by Wong with the use of SINR measurement and position information. In this regard, applicant need to show as to why it is critical to allow the pilot symbols to collide. Absent of showing criticality, collision of signals is obvious to occur if allowed.

Argument VI: with regard to claims 15, 16, 44 and 45, applicant asserts that neither Ritter nor Frodigh disclose selecting sub-carriers based on traffic load information. Continuing the argument, applicant further asserts "However, the examiner believes that Westroos discloses a load monitoring device that collects and holds traffic information on neighboring cells. ------. Thus, Westroos discloses load balancing at the cell level, not at the OFDMA cluster level. Load balancing at the OFDMA cluster level is much more efficient."

Response VI: examiner respectfully disagrees. When the prior reference are modified with the teaching of Westroos, the load balancing will be within the context of the Ritter's OFDMA cluster.

Argument VII: regarding claims 19, 20, 23, 48, 49 and 52, applicant argues, repeating the argument presented regarding claim 1, that Bodin does not remedy the deficiency in Ritter. For that reason, examiner has included these claims to the list of claims in argument I. However, it is important to mention that Bodin was cited to address features presented in the immediate above claims and directed to "arbitrarily ordering the set of candidates of sub-carriers as cluster of sub-carriers. Since, applicant did not present any argument directed to these features/feature, examiner has no point reference to further any discussion on this point. In the absence of such an argument, applicant is respectfully referred to the rejection of the claims above.

Argument VIII: with regard to claim 29, the argument is moot since the claim is allowed. However, examiner would like to take this opportunity to thank applicant for taking the proper action (identifying the intended prior art) as oppose to the one erroneously

provided applicant with a wrong patent number (US 6, 242,565), as if it was that of Feuerstein et al. An apology is forwarded for any inconvenient this may have caused.

Argument IX: with regard to claim 62, applicant asserts that neither Ritter nor Feuerstein teach nor disclose allocating OFDMA sub-carriers based on inter-cell interference avoidance and intra-cell traffic load balancing.

Response IX: examiner respectfully disagrees with the argument. One has to see the references as combined and based on the motivation provided. In this regard, the OFDMA clusters of sub-carriers and sub-carrier selection/allocation is provided by Ritter. What is missing is the inter-cell and intra-cell traffic load balancing. This later feature is provided by Feuerstein (see col. 2, lines 27-37). Feuersteing, in the cited section discusses about changing/adjusting network parameters wherein the network may involve, network wide area (involving plurality of cells) or cluster of local cell sites and the parameters are interference and traffic load in those either local or network wide areas. Hence, the argument is not persuasive. Also, please refer to claims 61 and 64, in Feuerstein.

Argument X: with regard to claims 7, 14, 26-28, 36, 43, 55, 58, 60 and 61, applicant presents same argument as presented regarding claim 1. Examiner respectfully refers applicant to the response made corresponding to argument I (i.e. Response I).

Argument XI: regarding claims 28 and 57, applicant asserts Frodigh does not teach, mention nor disclose the use of sub-carrier priority in OFDMA sub-carrier allocation.

Response XI: examiner agrees with applicant and hence, claims 28 and 57 have been objected (indicated allowable).

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Meless N Zewdu whose telephone number is (703) 306-5418. The examiner can normally be reached on 8:30 am to 5:00 pm..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, William Trost can be reached on (703) 308-5318. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Meless Zewdu

Examiner

19 January 2005.

WILLIAM TROST
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600